
A STUDY ON "QUALITY CONTROL PRACTICES AND THEIR EFFECTIVENESS" AT DUROFLEX PVT LTD, HOSUR

^{*1}Mrs. Saranya Durai, ²Mr. Anand Kumar R.

¹Assistant Professor Department of Management Studies, Adhiyamaan College of
Engineering (Autonomous)

²Department of Management Studies Adhiyamaan College of Engineering (Autonomous)

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***Corresponding Author: Mrs. Saranya Durai**

Assistant Professor Department of Management Studies, Adhiyamaan College of Engineering (Autonomous)

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ABSTRACT

Quality control plays a vital role in the manufacturing industry for ensuring product consistency, customer satisfaction, and operational excellence. In today's competitive market, effective quality control practices help organizations minimize defects, reduce waste, and maintain high standards. This study focuses on the role of quality control practices and their effectiveness at Duroflex Pvt Ltd, Hosur, a leading manufacturer of polyurethane foam, mattresses, pillows, and sleep solutions.

Quality control tools such as inspection checklists, statistical process control, testing procedures, and ISO standards help convert production data into meaningful insights, enabling faster detection of issues and better decision-making. The study adopts a descriptive research design using both primary and secondary data. A sample of 100 respondents, including production staff, quality inspectors, supervisors, and managers, was selected using convenience sampling. Statistical tools such as percentage analysis, Chi-square test, and ANOVA were used for analysis.

KEYWORDS: Quality Control, Manufacturing, Defect Reduction, ISO Standards, Operational Efficiency, Duroflex

I. INTRODUCTION

Quality control refers to the systematic process of ensuring that products meet specified standards and customer requirements through inspection, testing, and process monitoring. In

manufacturing industries, a large volume of production data is generated daily, including raw material quality, process parameters, and finished product specifications. Managing this data using traditional methods can be difficult, time-consuming, and prone to errors. Therefore, there is a need for effective quality control practices to maintain consistency and reliability.

Quality control helps manufacturing professionals identify variations, defects, and process inefficiencies quickly. It supports faster and more accurate decision-making by enabling supervisors and managers to understand critical production information. For example, statistical process control charts and testing dashboards can be used to monitor foam density, mattress durability, and material strength, which ultimately improves product quality and customer satisfaction.

In manufacturing units like Duroflex Pvt Ltd, Hosur, efficient quality management is essential for delivering high-quality sleep solutions. Quality control practices improve coordination among departments and support better resource utilization. They also enhance operational efficiency by reducing rework, minimizing waste, and optimizing production processes. Overall, quality control plays a vital role in improving both product standards and manufacturing performance, making it an essential component of modern manufacturing systems.

II. LITERATURE REVIEW

West et al. (2016): Explained that quality control practices play a key role in simplifying complex manufacturing data through charts, control limits, and dashboards.

Wang et al. (2018): Highlighted that manufacturing units generate massive amounts of process data daily, and quality control techniques help in identifying variations, trends, and root causes.

Dowding et al. (2017): Found that traditional inspection methods are slow and inefficient, whereas modern quality control improves quick detection of defects and enhances process accuracy.

Neumann et al. (2022): Stated that visual formats such as control charts and Pareto diagrams make it easier to understand relationships within production data.

Rind et al. (2015): Emphasized that real-time quality monitoring dashboards enable professionals to track key process indicators efficiently.

Murphy et al. (2021): Observed that quality control tools improve product safety by allowing early identification of risks and defects.

Lee et al. (2023): Explained that statistical process control enhances continuous monitoring and significantly improves production consistency.

Zhang et al. (2022): Found that quality control practices improve communication and coordination between production and quality departments.

Singh et al. (2024): Explained that quality control helps identify process bottlenecks and inefficiencies in manufacturing.

Johnson et al. (2025): Concluded that effective quality control supports operational excellence and overall manufacturing performance.

III. OBJECTIVES OF THE STUDY

- To understand quality control practices in manufacturing
- To analyze its usage in Duroflex Pvt Ltd
- To evaluate its impact on product quality and defect reduction
- To examine its role in improving operational efficiency
- To identify challenges in implementing quality control tools
- To suggest improvements for better implementation

IV. RESEARCH METHODOLOGY

This study adopts a descriptive research design to analyze the role of quality control practices in Duroflex Pvt Ltd, Hosur.

Data Collection

- **Primary Data:** Collected through structured questionnaires (Google Forms)
- **Secondary Data:** Journals, articles, and company records

Sample Size

- 100 respondents (Production staff, Quality inspectors, Supervisors, and Managers)

Sampling Method

- Convenience Sampling

Tools for Analysis

- Percentage Analysis
- Chi-square Test
- ANOVA
- Charts and Graphs

Research Objectives

- To understand quality control practices
- To analyze its usage in the organization
- To evaluate its impact on product quality
- To study its role in operational efficiency

V. DATA ANALYSIS AND INTERPRETATION DEMOGRAPHIC ANALYSIS

The demographic analysis reveals that the majority of respondents (67%) belong to the 21–30 age group, indicating that young professionals form the dominant segment of the study. Female respondents (61.5%) outnumber male respondents (38.5%), showing higher participation from women. In terms of occupation, production staff constitute the largest group (50%), followed by quality inspectors (20.2%), supervisors (17.3%), and managers (12.5%). Regarding experience, most respondents (46.2%) have less than one year of experience, while 35.6% have 1–3 years of experience. Only a small percentage of respondents have more than 3 years of experience. This indicates that the sample is largely composed of less experienced employees, which may influence the adoption and perception of quality control tools.

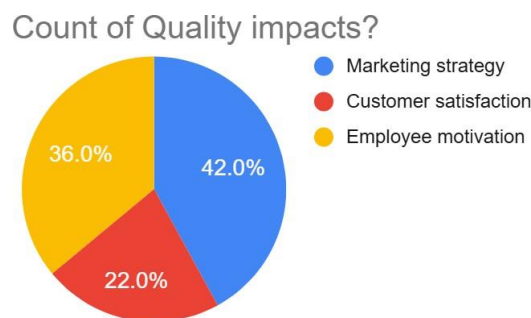


FIGURE 1 QUALITY CONTROL IMPACTS.

Particulars	No. of Respondents	Percentage
Marketing strategy	21	42%
Employee motivation	18	36%
Customer satisfaction	11	22%
Total	50	100%

Interpretation: Most respondents belong to the 21–30 age group (66.3%), indicating a strong presence of young individuals in the study.

QUALITY CONTROL PRACTICES

How often do you use quality control tools **Interpretation:** Most respondents use quality control tools regularly, with the highest usage on a daily and weekly basis. Only a small number use them rarely or never, indicating that quality control is widely adopted among respondents.

Interpretation: Basic inspection checklists and statistical process control are the most widely used tools, indicating their popularity and ease of use among respondents. Advanced tools are also being adopted gradually.

STATISTICAL ANALYSIS

Chi Square Test

A Chi-square test was applied to examine the purpose of using quality control practices among respondents. The calculated Chi-square value ($\chi^2 = 15.308$) with 3 degrees of freedom is greater than the critical value (7.815), and the p-value (0.00157) is less than the significance level of 0.05. Therefore, the null hypothesis is rejected, indicating a significant difference in respondents' preferences. The results clearly show that quality control is mainly used for defect reduction, followed by process monitoring.

Interpretation: The results show a significant difference in preferences, with quality control mainly used for defect reduction.

ANOVA Test

An ANOVA test was conducted to examine whether quality control charts help in understanding process variations easily among respondents. Since the significance level is less than 0.05, the null hypothesis is rejected. This indicates that there is a significant difference in respondents' opinions regarding the effectiveness of quality control tools.

Interpretation: The results reveal that most respondents either strongly agree or agree that quality control tools help in understanding process data easily. This reflects a positive

perception towards quality control practices.

VI. FINDINGS

The study was conducted with a sample size of 100 respondents from Duroflex Pvt Ltd, Hosur.

Quality control tools such as inspection checklists, control charts, and testing procedures were used to present the data clearly.

Most respondents showed a positive response towards the use of quality control in manufacturing.

Control charts helped in easy identification of process variations.

Percentage analysis indicated that a majority of respondents believe quality control improves product quality.

Chi-square test was applied to identify relationships between variables such as department, experience, and satisfaction.

The results of the Chi-square test showed that some variables have a significant relationship.

ANOVA test was used to compare differences among multiple groups like roles and departments.

ANOVA results indicated variation in responses across different groups.

Overall, quality control helps in better understanding of complex manufacturing processes.

The study concludes that quality control practices improve product quality, reduce defects, enhance operational efficiency, and support customer satisfaction.

VII. SUGGESTIONS

The company should increase the use of advanced quality control tools such as automated testing and real-time monitoring systems.

Proper training should be provided to staff to improve their knowledge of quality control techniques.

User-friendly quality dashboards should be implemented for easy access and understanding of process data.

The company should ensure regular updating of quality standards for accurate analysis and decision-making.

More interactive control charts and Pareto analysis can be used to improve clarity and presentation.

Raw material and process data accuracy should be maintained to avoid errors in quality

assessment.

The company should encourage the use of quality control tools in all production departments. Regular monitoring and evaluation of quality control practices should be done to improve performance.

Integration of modern technologies like AI and statistical software can enhance quality control.

Feedback from staff should be collected to improve the usability of quality control tools.

VIII. CONCLUSIONS

This study concludes that quality control plays a crucial role in improving manufacturing management and decision-making at Duroflex Pvt Ltd, Hosur. Manufacturing units generate a vast amount of production data every day, including raw material specifications, process parameters, and finished product details. In its raw form, this data is complex and difficult to interpret. Quality control practices such as inspection, testing, control charts, and statistical tools help transform this complex data into clear and meaningful formats, enabling production staff, quality inspectors, and management to easily understand and analyze the information.

The study is based on a descriptive research design and uses both primary and secondary data. A sample of 100 respondents is selected using convenience sampling. Percentage analysis is used to present the data in a simple form, while statistical tools like chi-square test are applied to identify relationships between variables, and ANOVA is used to compare differences among multiple groups. The results are also visually represented through charts, which improve clarity and interpretation.

The findings reveal that quality control supports faster and more accurate decision-making, improves communication among staff, and helps identify variations and defects in production processes. It also reduces rework and waste, saves time, and increases overall operational efficiency. Additionally, it supports effective planning, better resource allocation, and improved manufacturing performance.

Overall, quality control enhances product quality, increases company performance, and ensures efficient operations. It encourages data-driven decision-making, supports innovation in manufacturing practices, and helps maintain high standards of quality and customer satisfaction. Furthermore, it aids in better forecasting, process improvement, and strengthens the brand reputation by ensuring consistent and reliable products.

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